

What is claimed is:

1. An apparatus for opening and closing a cover of a cellular phone, comprising:

a body having a keypad;

5 a cover being engaged to the body slidably in forward and backward directions and having a display panel;

an upper plate engaged to a lower side of the cover;

a lower plate engaged to an upper side of the body, wherein said upper plate is slidably engaged to the lower plate;

10 a rotation plate rotatably engaged between the upper and lower plates and adapted to slidably move the upper plate in forward and backward directions with respect to the lower plate;

an elastic support means having one end fixed to the rotation plate and the other end movably supported by an upper surface of the lower plate, said elastic support means being adapted to elastically support the rotation plate when the upper plate is slidably moved; and

15 a stopper means provided in the upper and lower plates and adapted to limit a slidable movement of the upper plate with respect to the lower plate.

20 2. An apparatus for opening and closing a cover of a cellular phone, comprising:

a body having a keypad;

a cover engaged to the body slidably in forward and backward directions and having a display panel;

25 a rotation plate rotatably engaged to an engaging groove formed in an upper surface of the body and adapted to slidably move the cover in forward and backward directions with respect to the body;

an elastic support means having one end fixed to the rotation plate and the other end movably supported by a bottom surface of the engaging groove, said elastic support means being adapted to elastically support the rotation plate when the upper plate is slidably moved; and

5 a stopper means provided in the body and the cover, respectively, and adapted to limit a slidable movement of the cover being opened and closed with respect to the body.

3. The apparatus of claim 1, wherein said elastic support means includes:

10 a pair of cooperation bars each having one end engaged to the rotation plate, respectively, and cooperating with each other when the rotation plate is rotated;

a spring member engaged to an outer surface of the cooperation bars and being contracted and extended when the cooperation bars are moved;

15 a support piece fixed to the other ends of the cooperation bars wherein an outer surface of the support piece is formed in a circular shape; and

a fixture engaged to be opposite to the upper surface of the lower plate and having a support surface surface-contacting with an outer surface of the support piece.

20 4. The apparatus of claim 2, wherein said elastic support means includes:

a pair of cooperation bars each having one end engaged to the rotation plate, respectively, and cooperating with each other when the rotation plate is rotated;

25 a spring member engaged to an outer surface of the cooperation bars and being contracted and extended when the cooperation bars are moved;

a support piece fixed to the other ends of the cooperation bars wherein an

outer surface of the support piece is formed in a circular shape; and

a fixture engaged to be opposite to a bottom surface of the engaging groove of the body and having a support surface surface-contacting with an outer surface of the support piece.

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5. The apparatus of claim 1, wherein said stopper means includes:

an engaging groove and a fixing groove formed at both sides of the forward and backward portions of the upper plate; and

10 a stopper protruded from a bottom surface of the lower plate and adapted to limit a movement of the upper plate in such a manner that the engaging groove and the fixing groove are engaged.

6. The apparatus of claim 1, wherein a groove is formed on a bottom surface of the upper plate in a vertical direction with respect to the moving direction of the upper plate, and an engaging member capable of slidably moving the upper plate is
15 fixed to one end of the rotation plate when the engaging member is slidably moved in the interior of the groove.

7. The apparatus of claim 2, wherein a groove is formed on an inner surface of the cover in a vertical direction with respect to the moving direction of the cover, and
20 an engaging member capable of slidably moving the cover is fixed to one end of the rotation plate when the engaging member is slidably moved in the interior of the groove.

8. The apparatus of claim 2, wherein said stopper means includes:
25 an engaging groove and a fixing groove integrally formed on an inner surface of the cover at left and right sides in the forward and backward portions; and

a stopper protruded from a bottom surface of the engaging groove and adapted to limit a movement of the cover in such a manner that the engaging groove and the fixing groove are engaged with each other.

5 9. The apparatus of claim 1, further comprising:
 a flange portion formed at left and right sides of the upper plate; and
 a guide rail provided in the lower plate to correspond with the flange portion
and adapted to support the upper plate which is slidably moved with respect to the
lower plate.

10 10. The apparatus of claim 1, further comprising:
 a guide shoulder portion protruded from an upper surface of the lower plate
and being capable of distancing the rotation plate from the lower plate for thereby
achieving a smooth rotation.

15 11. The apparatus of claim 2, further comprising:
 a guide shoulder portion protruded from a bottom surface of the engaging
groove of the body and being capable of distancing the rotation plate from the
bottom surface of the engaging groove for thereby achieving a smooth rotation.

20 12. An apparatus for opening and closing a cover of a cellular phone,
comprising:

 a body having a keypad;
 a cover engaged to the body slidably in forward and backward directions
25 and having a display panel;
 an upper plate engaged to a lower surface of the cover wherein a first gear
is provided on a bottom surface of the upper plate;

a lower plate provided on an upper surface of the body wherein the upper plate is slidably engaged to the lower plate, and a second gear engaged with the first gear is rotatably engaged to the lower plate;

an elastic support means having one end fixed to the second gear and the other end movably supported by an upper surface of the lower plate, wherein said elastic support means elastically supports the second gear when the upper plate is slidably moved; and

a stopper means provided in the upper and lower plates and adapted to limit a slidable movement of the upper plate with respect to the lower plate.

13. An apparatus and opening and closing a cover of a cellular phone, comprising:

a body having a keypad;

a cover engaged to the body slidably in forward and backward directions and having a display panel;

a first gear integrally formed with an inner surface of the cover;

a second gear rotatably engaged to an engaging groove formed on an upper surface of the body, and engaged with the first gear, and adapted to slidably move the cover in forward and backward directions with respect to the body;

an elastic support means having one end fixed to the second gear and the other end movably supported by a bottom surface of the engaging groove and adapted to elastically support the second gear when the cover is slidably moved; and

a stopper means provided on a bottom surface of the cover and adapted to limit a slidable movement of the cover with respect to the body.

14. The apparatus of claim 12, wherein said elastic support means includes:

a pair of cooperation bars each having one end engaged to the second gear, respectively, and cooperating with each other when the second gear is rotated;

a spring member engaged to an outer surface of the cooperation bars and being contracted and extended when the cooperation bars are moved;

5 a support piece fixed to the other ends of the cooperation bars wherein an outer surface of the support piece is formed in a circular shape; and

a fixture engaged to be opposite to an upper surface of the lower plate and having a support surface surface-contacting with an outer surface of the support piece.

10 15. The apparatus of claim 12, wherein said stopper means includes:

an engaging groove and a fixing groove formed at both sides of the forward and backward portions of the upper plate; and

15 a stopper protruded from a bottom surface of the lower plate and adapted to limit a movement of the upper plate in such a manner that the engaging groove and the fixing groove are engaged.

20 16. The apparatus of claim 13, wherein said stopper means includes a stopper downwardly protruded from an inner surface of the cover and adapted to limit a slidable movement of the cover by surface-contacting with a lateral surface of the engaging groove when the cover is slidably moved.

17. The apparatus of claim 12, further comprising:

a flange portion formed at left and right sides of the upper plate; and

25 a guide rail provided in the lower plate to correspond with the flange portion and adapted to support the upper plate which is slidably moved with respect to the lower plate.

18. The apparatus of claim 17, wherein a locking means capable of fixing the upper plate with respect to the lower plate includes:

an engaging protrusion outwardly protruded from the flange portion of the upper plate; and

at least more than one locking groove provided in an inner side of the guide rail of the lower plate and adapted to correspond with the lower plate.

19. The apparatus of claim 12, wherein said first gear is formed of a rack gear, and said second gear is formed of a pinion gear.

20. The apparatus of claim 13, wherein said elastic support means includes:

a pair of cooperation bars each having one end engaged to the second gear, respectively, and cooperating with each other when the second gear is rotated;

a spring member engaged to an outer surface of the cooperation bars and being contracted and extended when the cooperation bars are moved;

a support piece fixed to the other ends of the cooperation bars wherein an outer surface of the support piece is formed in a circular shape; and

a fixture engaged to be opposite to a bottom surface of the engaging groove of the body and having a support surface surface-contacting with an outer surface of the support piece.